and the appendix excised the occurrence of immediate perforation would be anticipated in some cases, the production of general peritonitis would be prevented, and lives would be saved; on the other hand, many would be subjected to the hazards of laparotomy and excision in which there was no danger of perforation and which would have recovered spontaneously if let alone. The general principles that govern surgeons with reference to all operative work must, howeven, be applied here, and in any given case the probabilities of every kind must be given due weight in coming to a conclusion. Surgeons may still hesitate and defer operative attack in cases of appendicitis until well defined evidences of suppuration are obtainable, and their course cannot be said to be otherwise than prudent; surgeons may boldly expose the appendix and remove it upon the first symptoms of inflammation declaring themselves, and as long as their results are as favorable as those of Senn and McBurney, their course must be considered justifiable. The next few years will doubtless accumulate an abundant experience in this new path upon which more safe conclusions for general guidance may be based than can be upon the very limited experience as yet available. L. S. PILCHER.

THE ASEPTIC APPLIANCES AT THE HOTEL DIEU IN LYONS.

In an elaborate article,[1] Professor Poncet, of Lyons, France, describes what he has been able to accomplish in the construction of a new operating theatre at the Hotel Dieu, of that city. In planning the building, he aimed to meet all the demands of modern surgery to the highest possible degree. To inform himself fully, he visited the clinics of other countries, principally Germany, Switzerland and America. He aimed at the suppression of dangers to which all wounds are exposed—infection by the air and infection by contact. This double result was secured by the general disposition of the room, by its arrangement and by the rigorous adoption of everything which would assure asepsis and antisepsis.

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[1] Une salle d' operations a l' Hotel Dieu de Lyon. Par le Dr. ANTONIN PONCET, Professeur a la Faculte de Medecine de Lyon; Chirurgien en Chef de l' Hotel Dieu.

Quadrangular in form, the theatre measures about 28 feet in length by 19 in width. Its extreme height is about 22 feet. A single window, 13 feet high by 7 feet wide, allows an abundance of light to enter both from above and laterally. This window opens to the east and consists of eight large panes held in a metallic frame which presents the minimum of breadth to interfere with the light.

The ventilation of the room is secured mainly by means of this window, which looks out on the Rohne, and is always kept open except at the time of operating, as is also a double glass panel, forming the upper part of a large door at the opposite end of the room. Artificial light ample for all purposes is obtained, when needed, from a Wenham lamp of great power hanging from the center of the domelike ceiling; a small burner is also placed over each of the wash basins in two of the corners.

The walls, to the height of nearly five feet, are lined with large sheets of glass, closely joined together. These sheets are nearly an inch thick and present no elevation or depression, but form a continuous surface, polished like a mirror. Their inner face has been painted a rich brick red with a broad band of a deeper red as a border. This color not only renders the glass more pleasing to the eye, but also renders every soiled spot the more readily recognizable. Above this, the walls are covered with a smooth plaster of a rose gray tint.

On the right of the entrance is placed a plate of milk white opaque glass, which is used for a table for demonstrating specimens. Five glass plates, from a quarter to a third of an inch in thickness, are placed about six and a half feet from the floor on nickel plated brackets firmly fixed in the wall. They are separated from the wall in their entire length by an interval of two inches, which not only makes them easier to clean, but obviates the accumulation of dust in the interspaces. Upon them rest large bottles, containing the antiseptic solutions, and metal cases in which the antiseptic dressings are kept. The supports are of iron, nickel-plated and very easily kept in order. Near the bottom of each receptacle for antiseptic solutions is an orifice, in which is placed a branching tube, to the projections of which the rubber irrigation tubes are attached. On the outside in very distinct red letters are inserted the names of the contents of the receptacles.

The theatre is connected with the hospital by a pair of nickel-plated iron doors. They not only keep out external noises, but they also fulfill the same aseptic indications as the glass slabs. They are not subject to alterations like those of wood, and always present a brilliant polish. M. Poncet asks if this polish is not the prelude of asepsis, and remarks that his four months' experience convinces him that his opinion was correct. The luxurious appointments and the careful regard for asepsis have made a profound impression upon his attendants, and, in consequence, the room, after four months' use, is in identically the same state as when the first operation was performed in it.

The floor is composed of Vicat cement, which was considered preferable to the Mosaic employed so much in other countries, because it is cheaper, less slippery, and of very great endurance. Grayish white in color, it presents numerous points which prevent slipping. At the sides of the room this floor meets the glass slabs of the wall in a curve. The floor has a fall toward the center of about one and a half inches. From the four blunt angles of the room proceed four trenches toward the centre, terminating in a central opening closed by a bronzed iron grating. These principal trenches receive a number of accessory trenches which makes the flow of liquids easy. They then pass into a conduit under the floor, the care and cleansing of which is made very easy by certain openings usually closed by metal plates; these openings are near together and situated in the course of the conduit to a considerable depth. A trap placed at one point in this pipe insures disinfection and prevents regurgitative emanations from the sewer. This disinfection is further insured by the free flow of fluids from the wash bowls which pass in the same way.

The floor is kept aseptic by daily cleansing with water and brush after the operations, and by weekly washing with 5% carbolic solution.

A large marble grate without mouldings or other decorations, serves for a coke fire of sufficient power to maintain in the coldest weather, a temperature of 65° to 68° F. The various gas heaters for warming water, sterilizing, dressing, etc., also add to the temperature. M. Poncet thinks that an operating room where patients are sometimes exposed completely and for a considerable period at a time, is never too hot.

It is important however, that the surgeon and his assistants should be able to work without inconvenience, so he considers a temperature of 65° to 68° F. sufficient; but for more prolonged operations, he always takes the precaution of covering his patient with rubber sheeting leaving only the field of operation exposed, and surely preventing chilling.

The furniture of the room is very simple. Glass and iron, nickel-plated or bronzed are here again the only materials used. Two fixed glass tables of different dimensions stand at an inch and one-half from the wall, the interspace preventing the accumulation of debris. They hold hand basins, glass cases containing reels of ligatures, bottles for drains, etc. Another table is covered with various substances—ether, iodoform, tincture of iodine, etc.—of daily employment; before it stands, at an operation, the sister charged with handing the various solutions and preparing the dressings. The glass tops of these tables are an inch thick and they rest upon cylindrical metal legs; the same brick red color seen upon the walls is repeated here. Other tables have two shelves, and are used for instruments, dressings, cushions, etc., during the operation,

There are but few chairs, and they are made of bronzed iron, as also are the stools. One of the chairs is especially designed for the seat of the patient during operations upon the face or head which do not require anæsthesia.

The majority of operations naturally are performed upon an operating table. This too is original in conception. In its construction four considerations were sought to be satisfied:

1. Asepsis, easy to obtain and maintain.

2. Such an arrangement that the blood and other fluids might flow away rapidly without soiling the surgeon or his assistants or the patient.

3. Great simplicity in the disposition of its various parts and the suppression of every kind of mechanism.

4. Perfect solidity and stability without excluding great mobility.

The table which measures 78 inches in length by 26 inches in width, stands 36 inches from the floor and consists exclusively of glass and nickel-plated iron. It is composed of four triangular plates of glass inclining to a common centre by a declivity of an inch and a quarter. They converge at their apices to a central opening one inch in diameter in which is fixed a metal ring through which fluids may pass into a rubber tube to the floor. It is supported by four legs connected for the sake of stability, by cross-bars. It moves freely upon large castors and in spite of its 280 pounds weight, a single person can move it with ease. There are no arrangements for varying its elevation; if a change in the attitude of the patient is desired, it is accomplished at will with the use of rubber cushions of various sizes. At the head of the table where stands the assistant deputed to administer the anæsthetic swings a basin large enough to contain everything needed for anæsthesia—ether, chloroform, forceps for pulling out the tongue, etc. Closed, it disappears under the table but a very slight traction places directly under the hands of the anæsthetist all the objects which he may need. The table is also measured off into centimeters in its entire length so that measurements may rapidly be taken. On either side are slots for the reception of movable brackets which can be attached or detached at will. They hold plates of glass on which, in course of an operation the instruments, small cushions, etc., may be placed. The least spot, the slightest soiled point is readily apparent on the glass and nickel.

During an operation a mattrass 3 inches thick is placed on the table, agreeing exactly with the dimentions of the table; this mattress is composed of hair, covered with rubber. It is pierced through by various openings for the flow of liquids.

A railing of bronzed iron fastened to the floor, composed of three parts capable of being readily and firmly fastened together, is placed about the table during operations. It has the form of a horse-shoe and provides a free space next to the table in which the surgeon and his assistants may move with ease, while spectators are prevented from approaching too near.

Another operating table is provided for those cases in which the surgeon wishes to work between the patient's thighs. It is also of glass with a nickel plated frame work, and measures 48 inches wide. At its upper extremity is a receptacle for the anæsthetist's tools, as in the other table. On its two lower legs are placed two metallic rods with foot rests; the level of the rods may be raised or lowered as desired, and they may be swung around laterally to any desired position or slipped entirely around under the table.

In connection with the rubber cushions he uses exclusively for varying the attitude of the patient, Mr. Poncet remarks that they offer among other advantages that of ready asepsis; the rubber sheeting can be readily scrubbed and washed without inconvenience and without alteration with various antiseptic solutions generally employed. He also takes the precaution before using them to cover them with a compress of sterilized gauze which has been wrung out in a 1-1000 sublimate solution.

For transporting the patient, he uses a rolling bed made after the plan of Socin.

Mr. Poncet usually uses basins of his own devising which have the advantage of adapting themselves to the figure. A large cylindrical zinc receptacle 30 inches in diameter receives the soiled dressings. A dressing is thrown into the receptacle as soon as it is removed, to be burned a few moments later. The bottom of this apparatus is pierced with holes the size of a 2 franc piece which renders its cleansing very easy. Every day, after an operation, this toilet is made with great care.

There are in this operation hall therefore no corners and no placards in which dust may collect. The walls, the shelves, the tables, the utensils of all kinds are absolutely smooth, without any kind of decoration. The substances comprising them, glass and metal, being washed daily, seem to furnish the very best conditions for obviating *infection by air.* This apparent superfluity, this search for details has been imposed upon the operators by the numerous causes of surgical poisoning to which patients are exposed in a great hospital service, where the activity is considerable, and where, in the same locality are both infected and non-infected wounds.

While, however, he fears infection by air, he takes more particular precautions against infection by contact. These are considered in three different classes.

1. The hands of the surgeon and his assistants.

2. The instruments.
3. The sponges, tampons and dressings.

In addition, the patient himself may be considered when the region operated upon has not been disinfected with care, or at any time by accident the field of operation has been brought into contact with bedding or soiled clothing.

For asepsis of the hands, he provides a dresser with three large basins set into a plate of glass similar to those of which the tables are formed. One of these basins provided with a single glass faucet is reserved for washing the hands with 1-1000 sublimate solution. This solution is contained in a large glass bottle holding 50 litres, which is placed directly above the dresser, from which the antiseptic solution runs as desired by a rubber tube into the subjacent basin. Cold water, hot water and boiling water are also furnished in abundance as desired by four faucets. The hot water and boiling water are obtained from a large receptacle of 100 litres capacity.

In order to obtain entire asepsis, all solutions are prepared with boiled water. The soap and the nail brushes are placed upon little grates in small galvanized pans. For disinfection of the hands, he requires repeated washings with hot soap and water, immersion for several seconds in alcohol, 90°, and finally prolonged bathing with 1 1000 sublimate solution. The surgeon and every person who comes in contact with the patient must of course be clothed with a gown absolutely clean and absolutely aseptic. He uses for himself a gown with the sleeeves ending above the elbow, which makes it necessary to disinfect his entire forearm.

He is careful to avoid keeping his instruments in the old padded cases—indeed, he possesses but two cases, an amputation case and a resection case. The case in this instance is nickel-plated, and the instruments lie in metal racks.

All instruments are provided with a smooth metal handle, without ornament, and without even the maker's name—as plain as possible either plated with nickel or with German silver. Instruments employed on the living are not allowed to be used for partial necropsies —sawing of bone, incision of tumors, and the like. He has, more-over, two receptacles of zinc, labelled *Pieces anatomique*, designed to receive immediately upon their ablation all human *debris*. One of them will accommodate an entire extremity, the other is reserved for tumors and pathological specimens of small size.

Some hours before operating the instruments are all sterilized by heat in a sterilizer which M. Poncet describes very minutely. He claims to have had the best of results from this instrument and recommends it unreservedly.

This paper then enters with the greatest detail into a description of all the antiseptic materials, solutions, tubes and other drains and closes with a reference to the application of some of these points in individual classes of operations.

By this organization he claims to be sure of the absolute disinfection of all objects, of all substances which can be at a given moment in contact with the wounded. It may be thought that he is over-careful. This he considers an error, because it is not possible to take sufficiently into account all the numerous causes of infection in the midst of which operations are performed. This very minuteness avoids all the multitude of conditions which have been so great a source of mortality hitherto. He would even go further, and calls for the immediate erection of a second operating theatre for suppurating cases and for those affected with phlegmons, erysipelas, etc. A goitre, for example, can never be removed, a large joint can never be laid open, without fear, upon the same table and in the same room where a diffused phlegmon had been incised, or a gangrenous limb amputated.

JAMES E. PILCHER.